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Pesticide Fact Sheet Number 146
Bromine Chloride

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EPA, Office of Pesticide Programs, Registration Division

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U.S. Environmental Protection Agency
Office of Pesticide Programs
Registration Division (TS-767C)
401 M Street, SW
Washington, D.C. 20460

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16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors

Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, science findings.

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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Office of Pesticide Programs (TS-766C)
Washington, DC 20460

EPA

Pesticide Fact Sheet

Name of Chemical: Bromine Chloride
Reason for Issuance: New Chemical
Date Issued: 10/6/87
Fact Sheet Number: 146

1. Description of Chemical

Generic and Common Name: bromine chloride

Trade Names: Bromine Chloride, Bromine Chloride Disinfectant

EPA/OPP Pesticide Chemical Code: 020504

Chemical Abstracts Service (CAS) Number: 13863-41-7

Year of Initial Registration: 1987

Pesticide Type: Disinfectant, Algicide, Bactericide, Slimicide

U.S. Producers: Ethyl Corporation, Great Lakes Chemical Corp.

2. Use Patterns and Formulations

Application sites: Manufacturing Use Product for reformulation or repackaging or for use as a disinfectant, algicide, slimicide, bactericide for wastewater, commercial and industrial recirculating cooling water systems and industrial once through cooling water systems.

Type of formulation: liquid under pressure

Methods of application: injected via closed system into wastewater or cooling water.

Application rates: up to 1.7 lb per 10,000 gallons of wastewater or recirculating cooling water; up to 0.85 lb per 10,000 gallons of once through cooling water.

Usual carriers: none

3. Science Findings

Summary Science Statement: Based on the reviews of the data submitted, when used in accordance with widespread and commonly recognized practice, bromine chloride will not generally cause unreasonable adverse effects on the environment.

Chemical Characteristics:

Physical state: liquid under pressure

Odor: halogen (bromine/chlorine)

Boiling Point: 5° C

Melting Point: -66° C

Flashpoint: Non-flammable, but may ignite combustibles

Unusual handling characteristics: stored under pressure in 150 lb. and larger containers. In case of spills or leaks, use a self-contained breathing apparatus at or above 5 ppm chlorine and a full face, canister or cartridge respirator approved by NIOSH for chlorine below 5 ppm. Use lime slurry or dry soda ash to neutralize spills. Vapor releases should be controlled with water fog. Cylinders of anhydrous ammonia should be available for decontamination of bromine choride fumes.

Toxicological Characteristics:

Acute toxicity studies have been waived because bromine chloride breaks down into bromine gas and chlorine gas upon exposure to air. Both bromine gas and chloride are Class I poisons and the toxicity of bromine chloride is assumed to be the same as for bromine and chlorine gas. Information which EPA already has for chlorine is as follows:

Acute oral toxicity: N/A since it is a gas at room temperature.

Acute inhalation toxicity: Toxicity Category I. Inhalation LC_{50} (rat) = 293 ppm for 1 hr. Inhalation LD_{LO} (human) = 430 ppm for 1 hr. Inhalation TC_{LO} (human) = 15 ppm for pulmonary problems.

Primary skin and eye irritation: Toxicity Category I. Capable of causing severe burns.

Major routes of exposure: inhalation and skin and eye contact.

Problems which are known to have occurred with this chemical: none for bromine chloride, although incidents/accidents have occurred with chlorine gas.

Chronic, subchronic, mutagenic and teratogenic data are not required for the registration of bromine chloride for manufacturing use and for the industrial uses described above since the product is applied through a closed system.

Physiological/Biochemical Behavioral Characteristics: N/A
Environmental Characteristics: Upon application to water, bromine chloride immediately dissociates into hypobromous acid (HOBr) and hypochlorous acid (HOCl).

Ecological Characteristics:

EPA has reviewed approximately ten studies which compare the toxicity of HOBr to HOCl and concluded that HOCl appears to be more toxic than HOBr. Since there are currently registered products which produce HOCl (e.g., chlorine and sodium hypochlorite), products which produce HOBr are therefore considered to be as toxic or less toxic than those which produce HOCl.

Acute avian, fish, aquatic invertebrate, estuarine and marine organism toxicity studies for technical grade bromine chloride have been waived because organisms are not exposed to this chemical. However, the following studies are required to be conducted on HOBr, the pesticidal chemical to which organisms are exposed, as a condition of registration:

a. 96 hour LC_{50} for one coldwater species (rainbow trout) and one warmwater species (bluegill sunfish).

b. Acute 48 hour LC_{50} for an aquatic invertebrate (Daphnia magna).

c. Residue monitoring study for freshwater and estuarine/marine use patterns, using once-through cooling systems.

d. 96 hour LC_{50} study for sheepshead minnow.

e. 96 hour LC_{50} study for shrimp.

f. 96 hour embryo-larvae or the 48 hour shell deposition study for American oysters.

Efficacy review results: Although EPA does not require efficacy data for non-health related label claims, EPA reviewed several available studies which demonstrate that bromine chloride is efficacious for the uses described above.

Tolerance Assessment: N/A

4. Summary of Regulatory Position and Rationale

The applications for registration of this chemical meet the following criteria for conditional registration set forth in 51 FR 7628 dated March 5, 1986:

a. "Since the data requirement was imposed, there has been insufficient time for the data to have been generated." EPA reached a final decision concerning the data requirements for this chemical in August 1987, which did not give the registrants adequate time to generate the data prior to submitting an application. Normally, studies are required to be conducted on the technical grade of the active ingredient. However, in this case, EPA decided to require testing only on a breakdown product (hypobromous acid), which the registrants could not have foreseen.

b. "During the period of the conditional registration, use of the pesticide will not cause unreasonable adverse effects." EPA has concluded that the toxicity to aquatic organisms is the same or less than the toxicity of currently registered pesticides for use in industrial cooling water. Therefore, this criterion has been met.

c. "Use of the pesticide is in the public interest." EPA has reviewed studies which demonstrate that use of bromine chloride will be cost effective, that the product is efficacious and that the current NPDES discharge limit of 0.2 mg/l of total residual oxidant will be met with bromine chloride. In addition, the risk associated with bromine chloride will be no greater than and possibly less than the risk associated with currently registered products containing chlorine. Therefore, it is in the public interest to conditionally register bromine chloride.

As long as the data which are required are submitted within the time frames specified below, products containing bromine chloride will be conditionally registered. If data are not submitted on time, these products will be subject to cancellation.

5. Summary of Major Data Gaps	Deadline for Submission
96 hr. LC_{50} for rainbow trout or bluegill	6/30/88
48 hr. LC_{50} for aquatic invertebrate	6/30/88
96 hr. LC_{50} for sheepshead minnow and shrimp	6/30/88
96 hr. embryo larvae or 48 hr. shell deposition for American oyster	6/30/88
Residue monitoring for freshwater and estuarine environments during once through cooling water use	3/30/89

6. Contact Person at EPA

Jeff Kempter, PM 32
Disinfectants Branch
Registration Division (TS-767C)
401 M St., S.W.
Washington, D.C. 20460
Telephone: 703-557-3964

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